

133 FERC ¶ 62,123
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Appalachian Power Company

Project No. 2210-197

ORDER MODIFYING AND APPROVING REVISED
SEDIMENTATION MONITORING PLAN

(Issued November 05, 2010)

1. On June 28, 2010, Appalachian Power Company, licensee for the Smith Mountain Hydroelectric Project No. 2210, filed a revised Sedimentation Monitoring Plan (Plan) pursuant to Article 403 of the project license.¹ The project is located on the headwaters of the Roanoke River in Bedford, Campbell, Franklin and Pittsylvania Counties, Virginia.

Background

2. Article 403, as amended,² requires within 90 days of the effective date of the license, the licensee to file with the Commission, for approval, a final sedimentation monitoring plan that addresses sedimentation monitoring and remediation measures, as appropriate, at the Smith Mountain Project. The plan shall include the provisions of the proposed *Sedimentation Monitoring Plan*, filed July 15, 2008, with, at a minimum, the following revisions:

- (a) a provision to monitor and address any adverse effects of sedimentation on project operation;
- (b) the types of actions Appalachian Power would implement (*e.g.*, methods for dredging), and under what conditions Appalachian Power would propose dredging at a project recreation site;
- (c) add Craddock Creek, Mitchells Cove, and areas near Mariners Landing in the list of areas to be monitored under the plan; and
- (d) the deletion of section 2 (Formation of a Basin-Wide Watershed Committee) from the plan.

¹ 129 FERC ¶ 62,201 (2009).

² On September 16, 2010, the Commission issued an Order on Rehearing and Clarification, 132 FERC ¶ 61,236, which revised Article 403 by adding subparagraph (a).

3. The revised sedimentation monitoring plan shall be prepared in consultation with the Virginia Department of Game and Inland Fisheries (VDGIF), the Virginia Department of Environmental Quality (VDEQ), the Virginia Department of Conservation and Recreation (VDCR), the Tri-County Relicensing Committee (TCRC), the Smith Mountain Lake Association (SMLA), the Leesville Lake Association (LLA), the Tri-County Lake Administrative Commission (TCLAC), the local Soil and Water Conservation Districts, the counties' Sediment and Erosion Control Departments, and Ferrum College. The licensee shall include with the sedimentation monitoring plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the aforementioned consulted entities, and specific descriptions of how their comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the entities to comment before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

4. The Commission reserves the right to require changes to the revised sedimentation monitoring plan. Implementation of the sedimentation monitoring plan, including any land-disturbing activities therein, shall not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee shall implement any such modification(s), including any changes required by the Commission.

Proposed Plan

5. The Plan includes three sections: Monitoring of Sediment, Reporting, and Coordination with Other Management Plans and Implementation Schedule. The Monitoring of Sediment section provides the method for monitoring sediment, a list of sites to be monitored, the frequency of monitoring surveys, and the procedures for determining if dredging is required at recreation sites. The Reporting section discusses the frequency of monitoring reports and the contents of the reports. The Coordination and Implementation section details the procedures for Technical Review Committee reviews and an implementation schedule.

6. As proposed, the method for monitoring of sediment will be to utilize high resolution digital bathymetry data obtained through the use of multibeam scanning sonar or similar equipment. The collected data will be used to produce a two-foot contour map of sedimentation in the vicinity of the areas listed below and at the shoaling areas identified in Appendix A of the Plan. The areas to be monitored include: Blackwater River (headwaters), Roanoke River (headwaters), Pigg River, Old Woman's Creek, Big Indian Creek, Little Indian Creek, Grimes Creek, Lynville Creek, Gils Creek, Staniford Creek, Beaverdam Creek, Becky's Creek, Betty's Creek, Craddock Creek, Mitchell's Cove, and the Public Access Sites as listed in the Licensee's Recreation Plan. The first survey will be completed within one year of the Commission's approval of the Plan and additional surveys will be conducted every five years thereafter.

7. The Reporting section restates the Licensee's intention to complete the first survey within one year of Plan approval and then to complete additional surveys every five years. The survey reports will include:

- Results of Appalachian's sedimentation survey
- Comparisons of survey data to previous survey results for all sites listed above
- Identification of impacts of sediment deposits on public access sites
- Identification of actions to be taken by Appalachian to address impacts of sediment deposits on public access sites, with any proposed action to be taken within the project boundary requiring Commission approval.
- Identification of actions to be taken by the Erosion/Sediment Control Technical Review Committee, with any proposed action to be taken within the project boundary requiring Commission approval.
- Identification of measures/actions that are intended to be implemented under the license and those that should be considered outside of the license.
- Comments provided by members of the Technical Review Committees.

8. The Coordination and Implementation section states the Licensee will prepare a draft report and provide it to the Aids to Navigation Technical Review Committee, Recreation Technical Review Committee, Aquatic Vegetation Technical Review Committee, Habitat Technical Review Committee, and Water Quality Technical Review Committee. The committees will be given 30 days to provide comments on the draft. A second draft report based on comments received will be prepared and then provided to the Erosion/Sediment Technical Review Committee for another 30 day comment period. The Erosion/Sediment Technical Review Committee will be comprised of representatives from the VDGIF, VDEQ, VDCR, TCRC, SMLA, the local Soil and Water Conservation Districts, the counties' Sediment and Erosion Control Departments, and Ferrum College. The Licensee will then prepare a final report and file it with the Commission within six months of the surveys.

Consultation

9. On March 28, 2010, the licensee forwarded copies of the revised plan to the VDGIF, VDEQ, VDCR, TCRC, SMLA, LLA, TLAC, the four local Soil and Water Conservation Districts, Bedford County, Campbell County, Franklin County, Pittsylvania County, and Ferrum College for a 30-day review period. Comments were received from the VDEQ on April 5, 2010, the VDGIF on April 14, 2010, and the SMLA on April 27, 2010. No other agencies provided comments on the plan.

10. The VDGIF requested additional language adding a requirement to coordinate with the VDGIF when determining recreation area dredging requirements and to consider lengthening boat ramps. The VDEQ requested an effort be made to quantify the amount

of sediment transfer into the lakes between the initial start up and the first bathymetric survey and to be included in the Technical Review Committee. The SMLA commented that although the plan is consistent with the new license it only monitors sedimentation and does not reduce sediment deposition or offset its impacts.

11. The licensee included the additional language as requested by the VDGIF and made the revisions to the plan as requested by the VDEQ. In response to the SMLA comments, the licensee stated the plan does address impacts as they relate to recreation sites and most of the sedimentation is caused by sediment entering from areas over which the licensee has no control.

Discussion and Conclusion

12. The proposed plan did not include a provision to monitor and address any adverse effects of sedimentation on project operation.³ The licensee should include in its monitoring reports: (1) an identification of any adverse effects of sedimentation on project operation, and (2) an identification of actions to be taken by Appalachian to address impacts of sediment deposits on project operations, with any proposed action to be taken within the project boundary requiring Commission approval.

13. The purpose of the plan is to monitor sedimentation within the Smith Mountain Lake and Leesville Reservoir. The licensee's plan was developed in consultation with the relevant agencies and all comments provided are adequately addressed or incorporated in the plan. This plan is consistent with the requirements of Article 403 and, therefore, is approved, as modified.

The Director orders:

(A) Appalachian Power Company's Sedimentation Monitoring Plan, filed June 28, 2010, pursuant to Article 403 of the Smith Mountain Hydroelectric Project license, as modified by ordering paragraph (B), is approved.

(B) The licensee shall include in its Sedimentation Monitoring reports (1) an identification of the impacts of sediment deposits on project operation and (2) an identification of actions to be taken by Appalachian to address impacts of sediment deposits on project operations, with any proposed action to be taken within the project boundary requiring Commission approval.

³ The Plan was filed prior to the addition of this required provision by the Order on Rehearing and Clarification, 132 FERC ¶ 61,236, which revised Article 403 by adding subparagraph (a).

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(C) This order constitutes final agency action. Any party may file a request for rehearing of this order within 30 days from the date of its issuance, as provided in section 313(a) of the FPA, 16 U.S.C. § 8251 (2006), and the Commission's regulations 18 C.F.R. § 385.713 (2010). The filing of a request for rehearing does not operate as a stay of the effective date of this order, or of any other date specified in this order. The licensee's failure to file a request for rehearing shall constitute acceptance of this order

M. Joseph Fayyad
Engineering Team Lead
Division of Hydropower Administration
and Compliance

**Appalachian Power Company
Smith Mountain Project No. 2201**

Sedimentation Monitoring Plan

June 2010

Background

A Sedimentation Study was conducted for the relicensing of the Smith Mountain Project to assess sedimentation that has occurred at the Project since it was constructed and to identify areas subject to shoaling and subaqueous sedimentation. Overall, there is an 11% storage reduction at Leesville and a 6% storage volume reduction at Smith Mountain due to sedimentation. However, these figures also include the deep portions of the lakes that are outside of the water level zone that is utilized for operations. The Smith Mountain Project is a pumped storage project that utilizes Leesville (lower development) to hold water until it can be pumped back into the Smith Mountain Lake (upper development) for reuse. The actual storage volume reduction in Leesville between elevations 600 and 613 (zone of operation) is approximately 5.5 %. The actual storage volume reduction in Smith Mountain between the 790 foot and 795 foot elevations is approximately 5%. The reduction in storage volume does not prevent Appalachian from utilizing Smith Mountain as a pumped storage project.

Mapping of areas of shoaling and subaqueous sedimentation was completed as part of the Sedimentation Study. Copies of these maps are located in Appendix A of the Monitoring Plan. The results from the mapping indicate significant amounts of sedimentation and shoaling occurring at the outlets of tributary rivers, streams and coves to the lakes. In the cases of shoaling and sedimentation below coves, it was evident from visual inspection, field surveys and shoreline reconnaissance that land disturbing activities such as development outside of the project boundary were the direct causes of reservoir sedimentation. In forested coves, shoaling and sedimentation were relatively insignificant. In Leesville Lake, significant amounts of sand were identified as beds of submerged sand dunes in areas downstream of the Pigg River confluence. The sediment from the Pigg River also results from watershed sources.

Sedimentation from shoreline erosion was concentrated along nearly the entire reservoir margins. It was concentrated as bench deposits in the littoral areas in both Smith Mountain and Leesville Lakes. However, it is likely that much of this erosion occurred during the initial years of project operation and is taking place at a lower rate now that most wave action (the dominant erosive force) is occurring against a more resistant underlying rock. (Baird, 2007) While shoreline erosion results in a net transfer of sediment within the operational limits of the reservoir pools, it is sedimentation sources with origins external to the Project that reduces reservoir storage capacity and causes extensive shoaling and subaqueous sedimentation.

The Sedimentation Study determined that Project operation is not the primary source of sediment coming into the reservoirs. While a reduction in useable storage has occurred, sedimentation is not impacting Appalachian's ability to operate the Smith Mountain as a pumped storage project. Over the term of the next license, Appalachian is proposing to conduct post licensing monitoring of specific sites on both Smith Mountain Lake and Leesville Lake. This monitoring will document the rate of sedimentation in these areas and identify impacts of sediment in these areas.

1. Monitoring of Sediment:

- a) **Methods:** High resolution digital bathymetry data will be obtained utilizing multibeam scanning sonar or other similar equipment. The data will be collected so as to produce a map with 2 foot contours that is compatible with the methods used for collecting the bathymetry data during relicensing of the Smith Mountain Project. Survey data will be collected in the vicinity of the areas identified in Section 1.b. below to determine the changes in sediment deposition in these areas. The survey data shall be collected at shoaling areas as shown on the maps in Appendix A to determine any migration of those shoaling areas.
- b) **Locations to be Monitored:** Major Tributaries Previously Identified in the Relicensing Sedimentation Study as specific areas of concern. The following locations are to be monitored:
- Blackwater River (headwaters)
 - Roanoke River (headwaters)
 - Pigg River
 - Old Woman's Creek
 - Big Indian Creek
 - Little Indian Creek
 - Grimes Creek
 - Lynville Creek
 - Gills Creek
 - Staniford Creek
 - Beaverdam Creek
 - Becky's Creek
 - Betty's Creek
 - Craddock Creek (includes area adjacent to Mariners Landing)
 - Mitchell's Cove (includes area adjacent to Mariners Landing)
 - Public Access sites (as listed in Appalachian's Recreation Plan) where accumulated sediments have been reported
- c) **Frequency:**

This survey will be completed every five (5) years. The first survey will be completed within one year following the Federal Energy Regulatory Commission's (Commission) approval of the Sediment Monitoring Plan.

d) Comparison to previous bathymetry:

The bathymetry data collected will be compared to the previous data to determine changes in sediment deposition in the areas listed in Section 1.b. of the plan.

e) Project Recreation Sites

For Appalachian's Project recreation sites, the Virginia Department of Game and Inland Fisheries (VDGIF) and Virginia Department of Conservation and Recreation (VDNR) will be consulted regarding the need to remove sediment hindering access at these sites. Recreation area dredging requirements at ramps managed by VDGIF should take into consideration the possible need to lengthen individual ramps to provide reservoir access during periods of drought. If it is determined that sediment removal is necessary, Appalachian will prepare a sediment removal plan that will include removal methods (*e.g.* hydraulic, clamshell), disposal methods, amount to be dredged, and detailed drawings of the area to be dredged. The plan will be provided to the Erosion/Sediment Technical Review Committee as outlined in Section 3 for their review and comment. The plan will be filed with the Commission for approval prior to the sediment removal.

The methods of removal and disposal will be determined in consultation with the agencies based on site specific characteristics such as location, access for equipment, and adjacent structures. Conditions under which Appalachian would propose dredging at a specific site include having less than four feet of water depth between the ramp and the channel which results in the interference with access.

Appalachian will obtain all necessary local, state and federal permits for the dredging and disposal of the sediment. No original bottom will be removed.

2. **Reporting:**

a) Reporting:

A report of the sediment survey findings will be developed following the 5-year survey. This report will have been reviewed by various Technical Review Committees as described in Section 3 below and will contain their comments Appalachian will file the report with the Federal Energy

Regulatory Commission within six months following the 5-year sediment survey.

b) Report Contents:

The 5-year report will contain the following:

- Results of Appalachian's sedimentation survey
- Comparisons of survey data to previous survey results for all sites listed in Section 1.b. above.
- Identification of impacts of sediment deposits on public access sites as identified in Appalachian's Recreation Management Plan.
- Identification of actions to be taken by Appalachian to address impacts of sediment deposits on public access sites as identified in Appalachian's Recreation Management Plan. Any proposed action to be taken within the project boundary will require prior Commission review and approval.
- Identification of any actions to be taken by the Erosion/ Sediment Technical Review Committee as a whole or by individual members of the committee. Any proposed action to be taken within the project boundary will require prior Commission review and approval.
- Identification of measures / actions that are intended to be implemented under the license and those that should be considered outside of the license.
- Comments provided by the members of the Technical Review Committees.

3. Coordination with Other Management Plans and Implementation Schedule:

Appalachian will prepare a draft report detailing the survey results, comparison to previous survey data, an assessment of impacts of sedimentation, any proposed actions to be taken to address sediment and a proposed implementation schedule. This draft report will be provided to the Aids to Navigation Technical Review Committee; Recreation Technical Review Committee, Aquatic Vegetation Technical Review Committee, Habitat Technical Review Committee, and Water Quality Technical Review Committee their for review and input related to their respected areas. (Details regarding these Technical Review Committees can be found in the individual Management Plans.) These committees will be given 30 days to provide comments. Appalachian will then prepare a second draft report based on input from the various Technical Review Committee and provide that report to the Erosion / Sediment Technical Review Committee which will be made up of representatives from Virginia Department of Game and Inland Fisheries, Virginia Department of Environmental Quality, Virginia Department of Conservation and Recreation, the Tri-County Relicensing Committee (or its successor), the Smith Mountain Lake Association, the Leesville Lake Association, the Tri-County Lake Administrative Commission, the local Soil and Water Conservation Districts, the counties' Sediment and Erosion Control Departments, and Ferrum College for their review and comment. This committee will be given 30 days to provide comments. Appalachian will then prepare the final report as detailed in Section 3.b. above to the FERC.

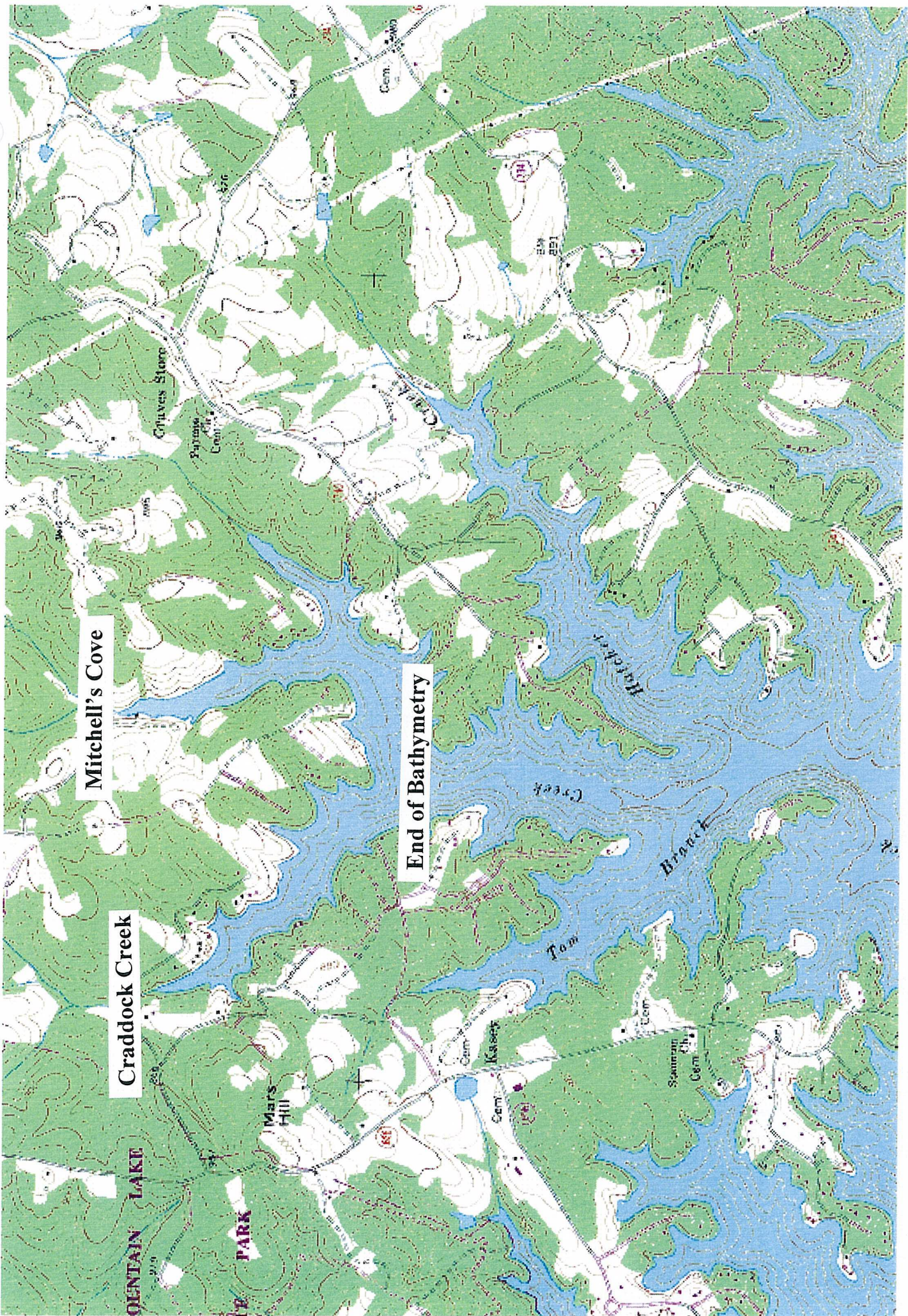
The initial sedimentation survey under the management plan will occur within one year following Commission approval of the Sediment Monitoring Plan under the new license. Additional surveys will be completed every five years thereafter. The report required by the management plan will be filed with the Commission within 6 months following the survey.

Cited Literature:

Baird and Associated, 2007. Smith Mountain Project Erosion Study Report, Revision 2.

Appendix A – Mapping of Shoaling Areas

Appendix A – Mapping of Shoaling Areas



Mitchell's Cove

Craddock Creek

End of Bathymetry

MOUNTAIN LAKE

PARK

Mars Hill

Kasey

Tom

Branch

Creek

Hatcher

Graves Stone

Pajama
Creek

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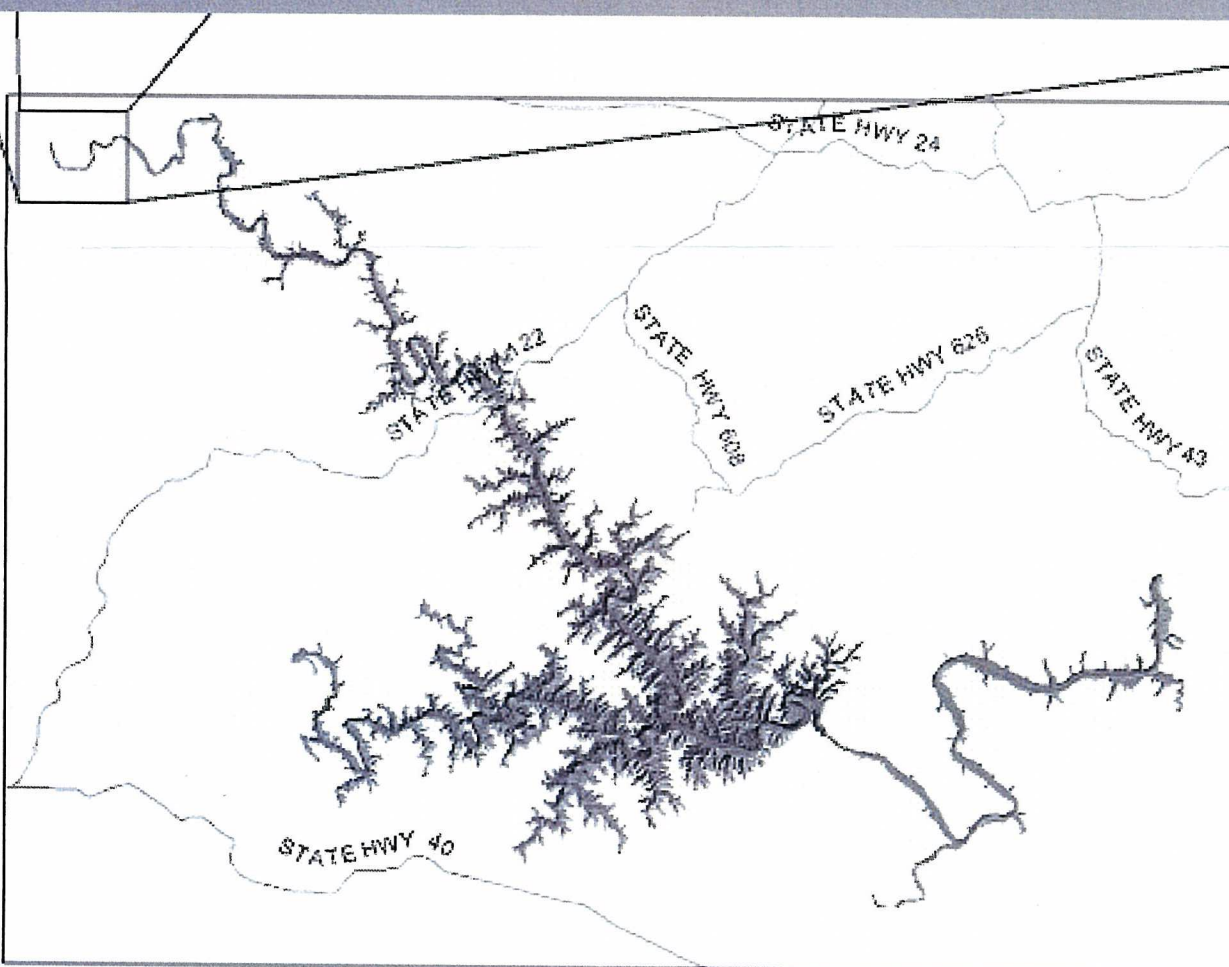
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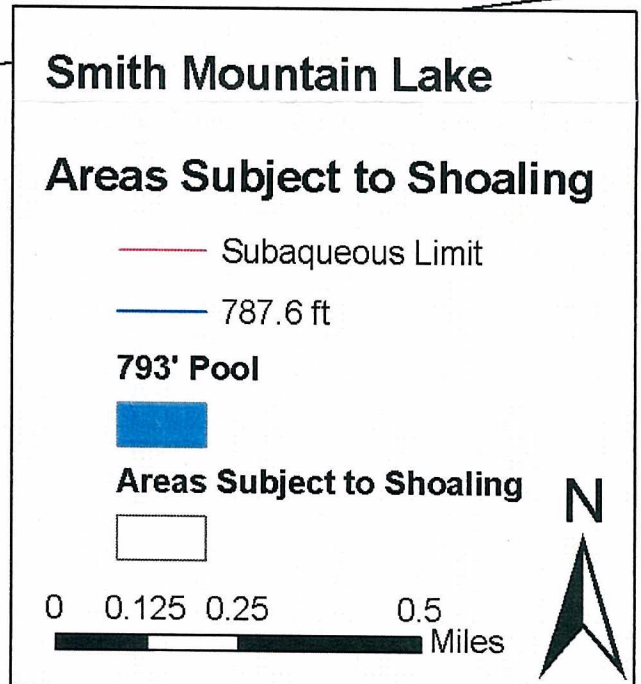
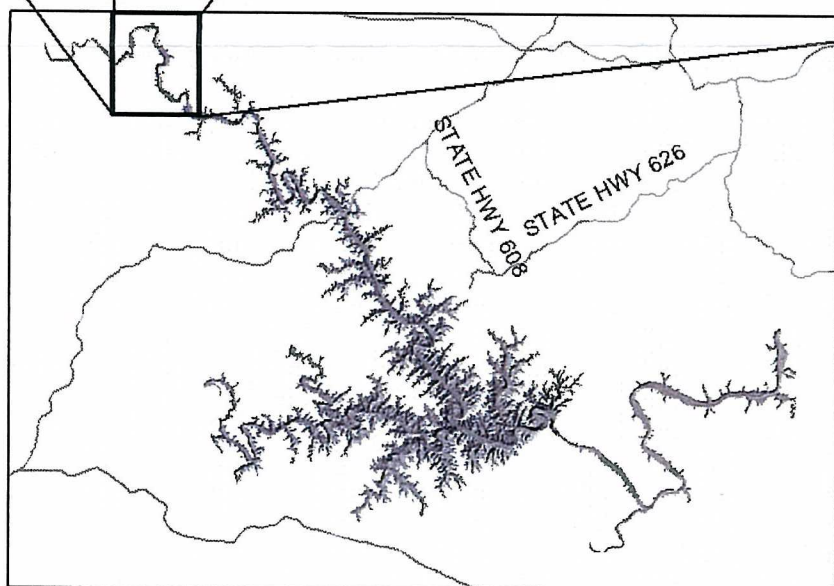
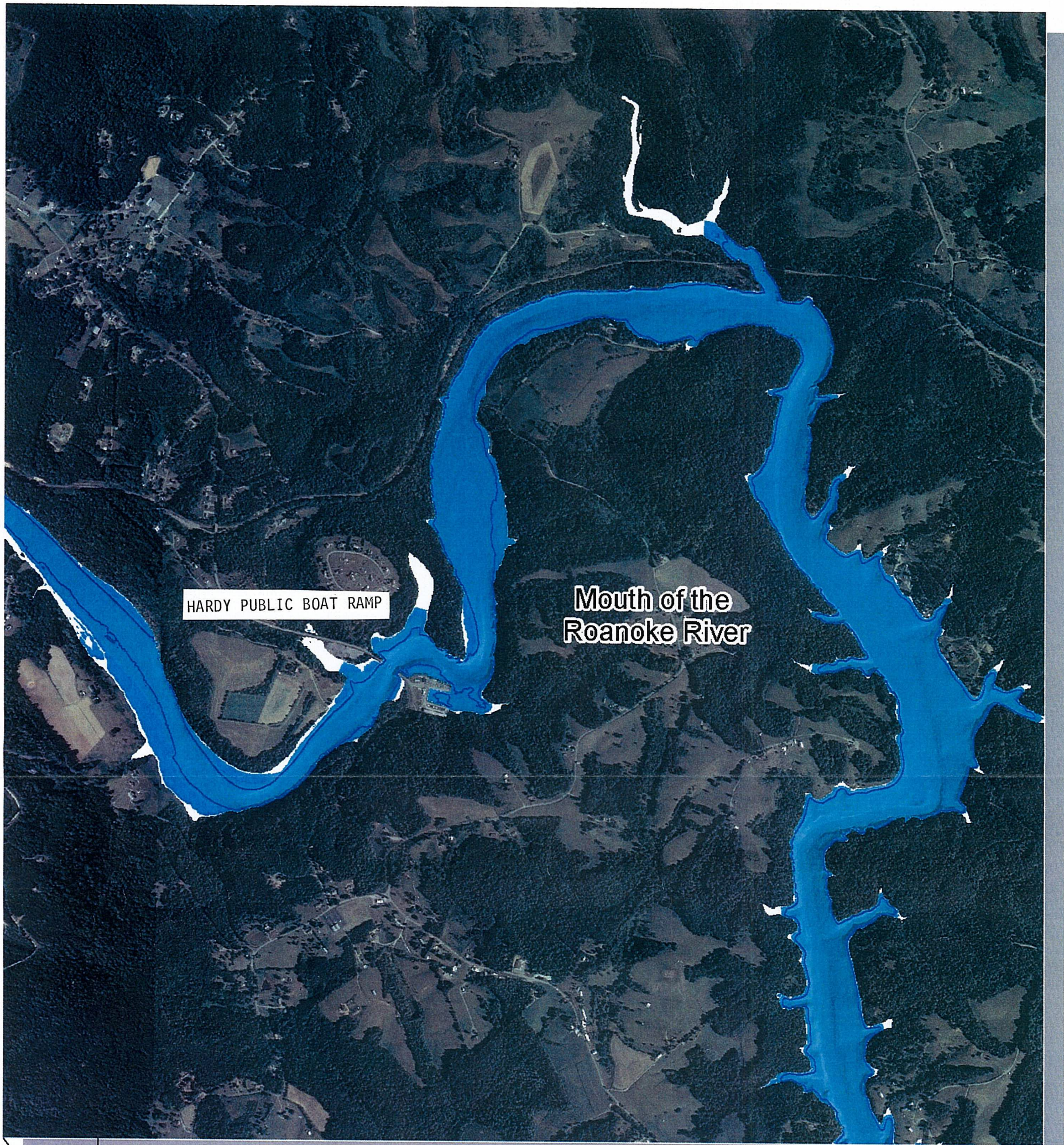
Smith Mountain Lake

Areas Subject to Shoaling

- Subaqueous Limit
- 787.6 ft
- 793' Pool
- Areas Subject to Shoaling
-

0 0.125 0.25 0.5 Miles

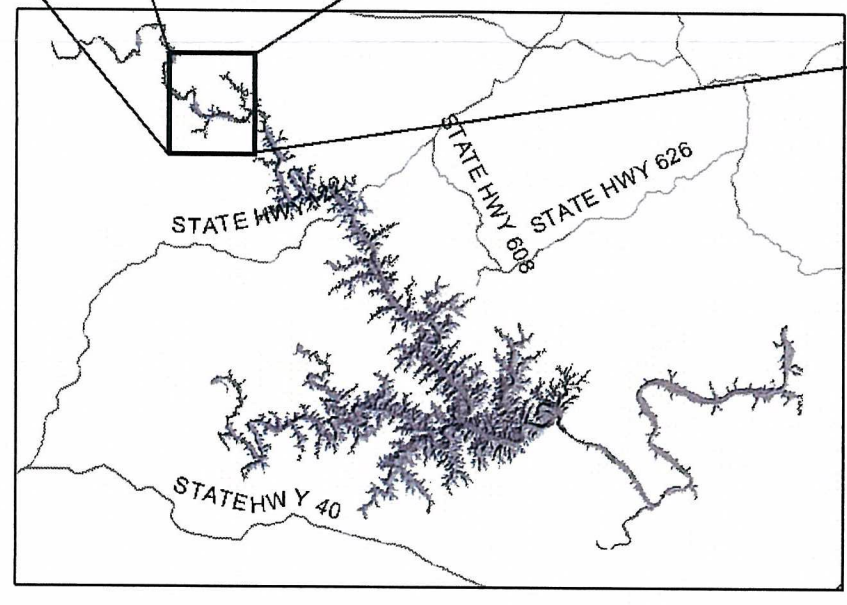
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Beaverdam
Creek

Lynville
Creek



Smith Mountain Lake

Areas Subject to Shoaling

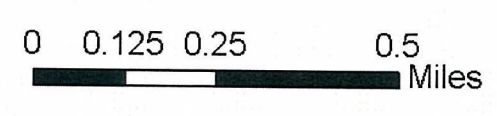
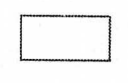
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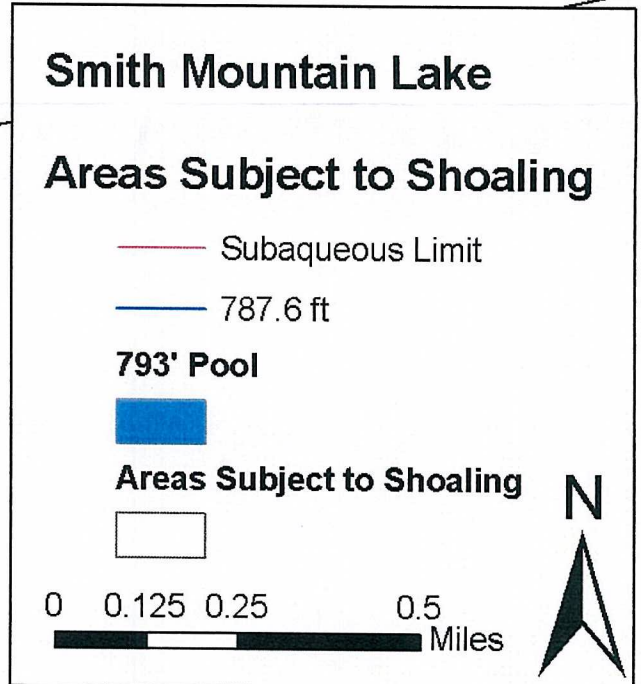
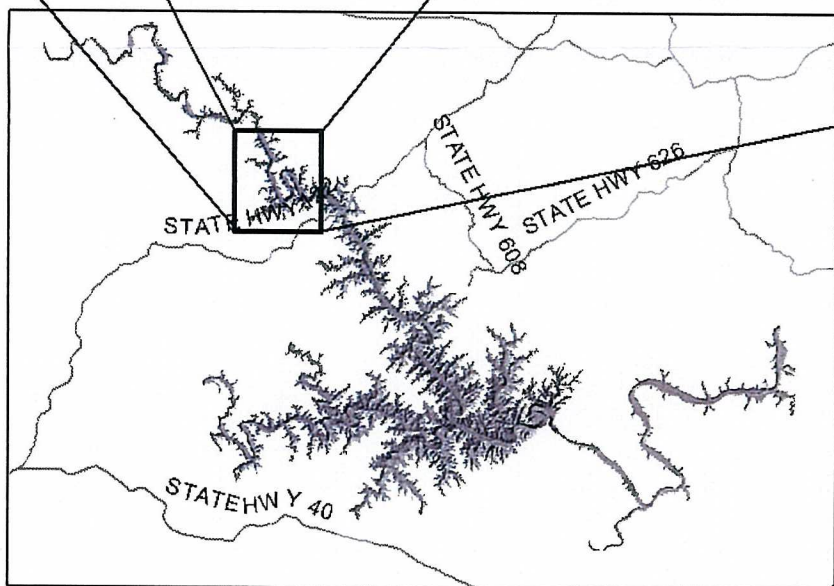
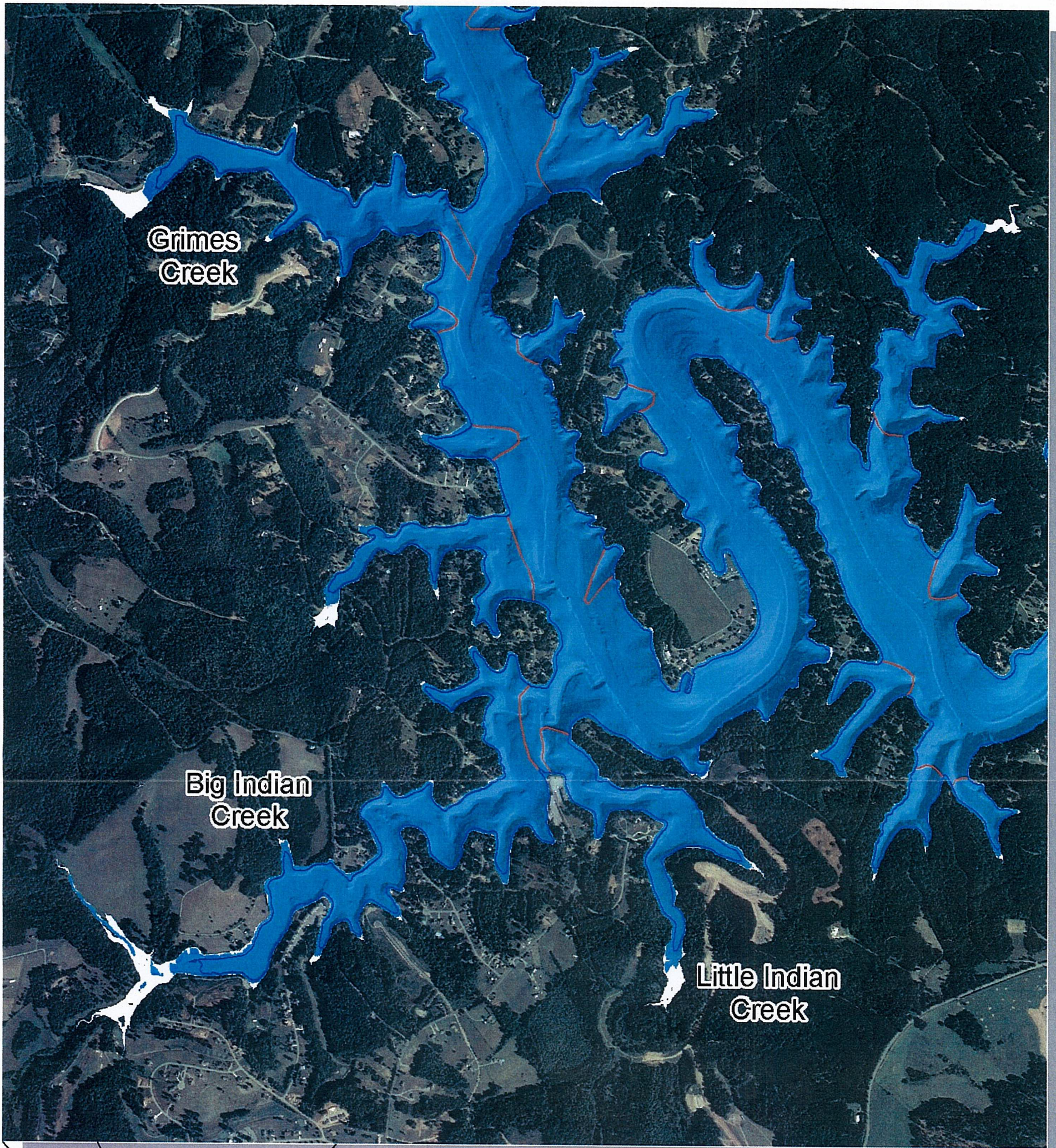
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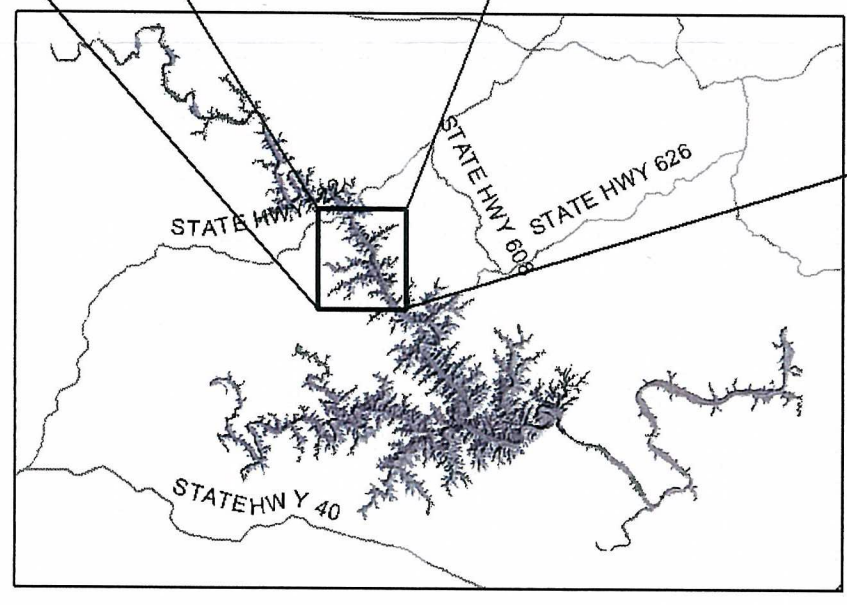
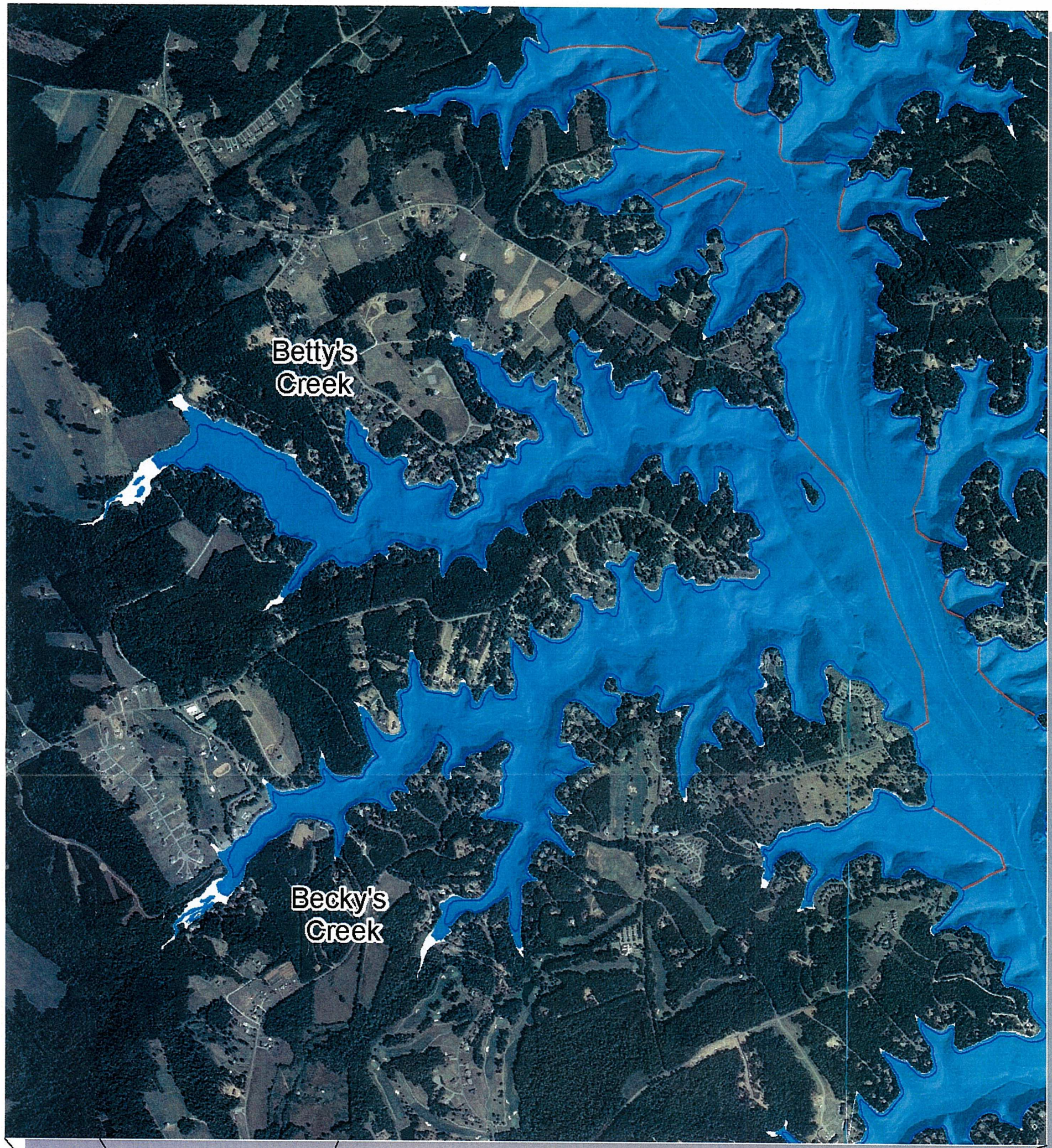
793' Pool



Areas Subject to Shoaling







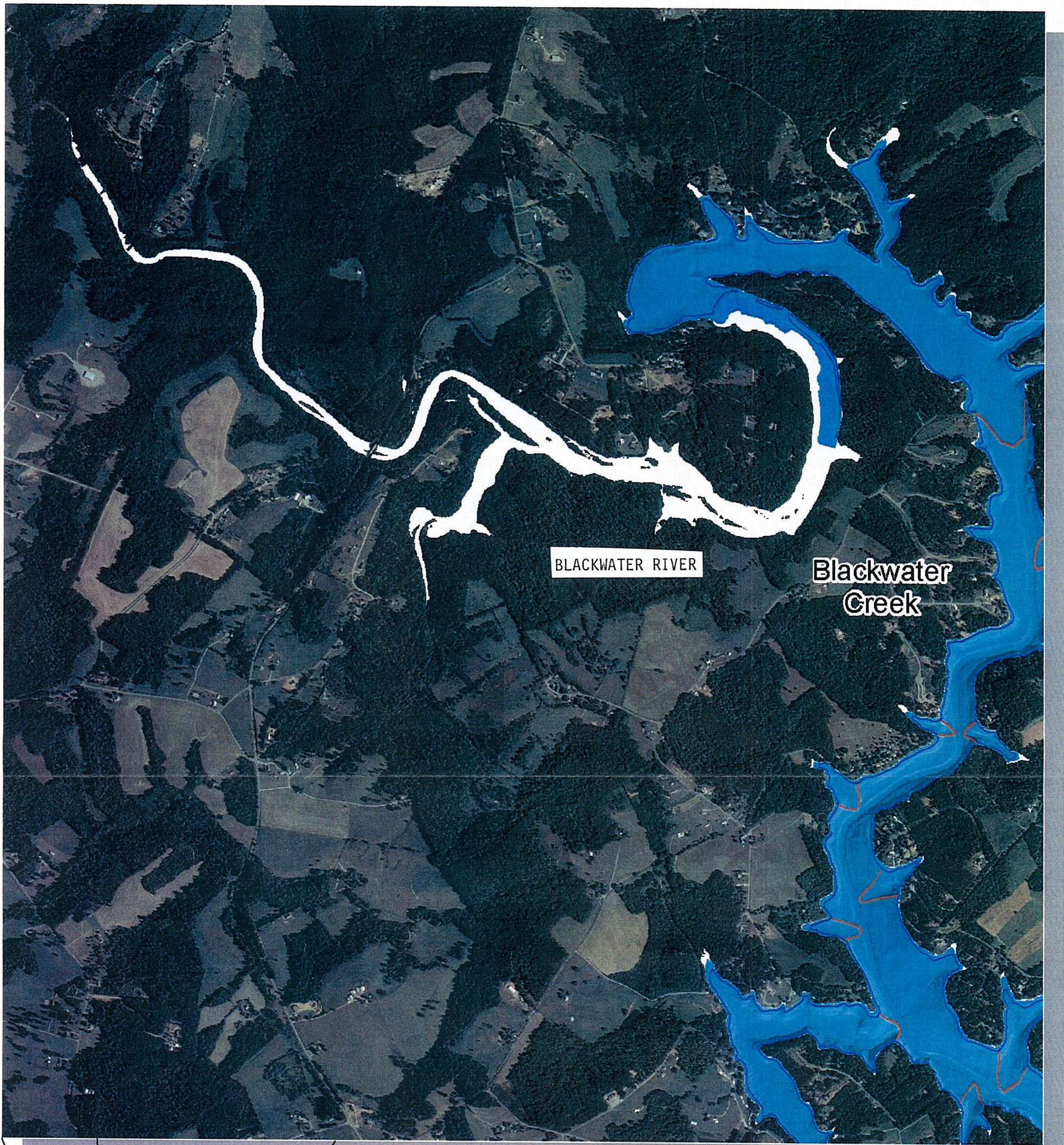
Smith Mountain Lake

Areas Subject to Shoaling

- Subaqueous Limit
- 787.6 ft
- 793' Pool**
- Areas Subject to Shoaling
-

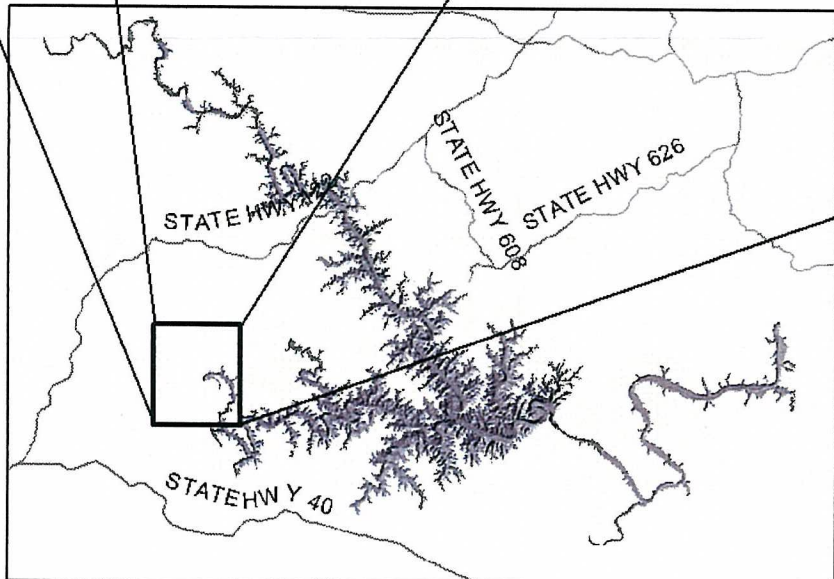
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BLACKWATER RIVER

Blackwater
Creek



Smith Mountain Lake

Areas Subject to Shoaling

— Subaqueous Limit

— 787.6 ft

793' Pool

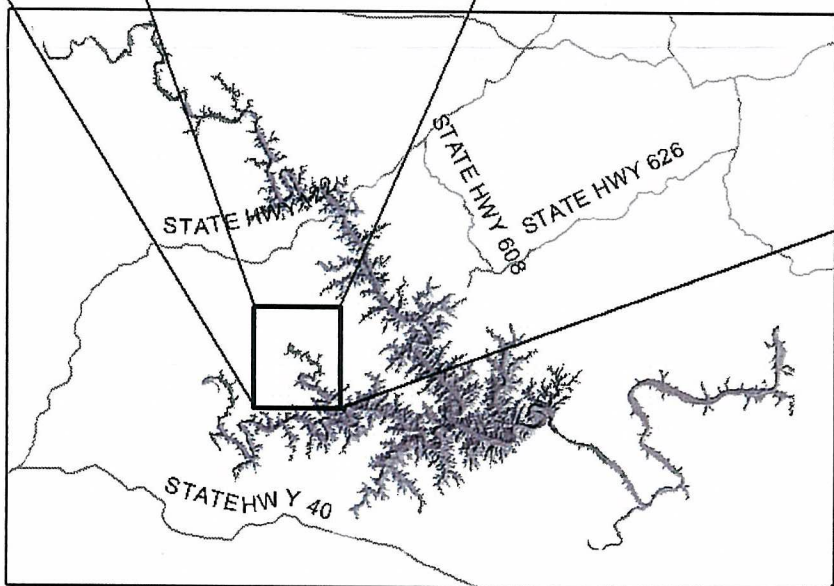
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Areas Subject to Shoaling

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Smith Mountain Lake

Areas Subject to Shoaling

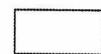
— Subaqueous Limit

— 787.6 ft

793' Pool

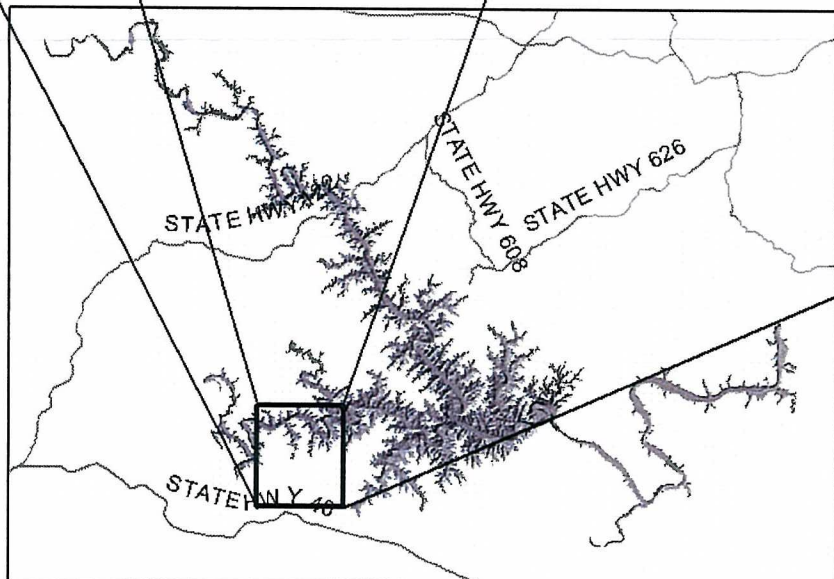


Areas Subject to Shoaling



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Smith Mountain Lake

Areas Subject to Shoaling

— Subaqueous Limit

— 787.6 ft

793' Pool

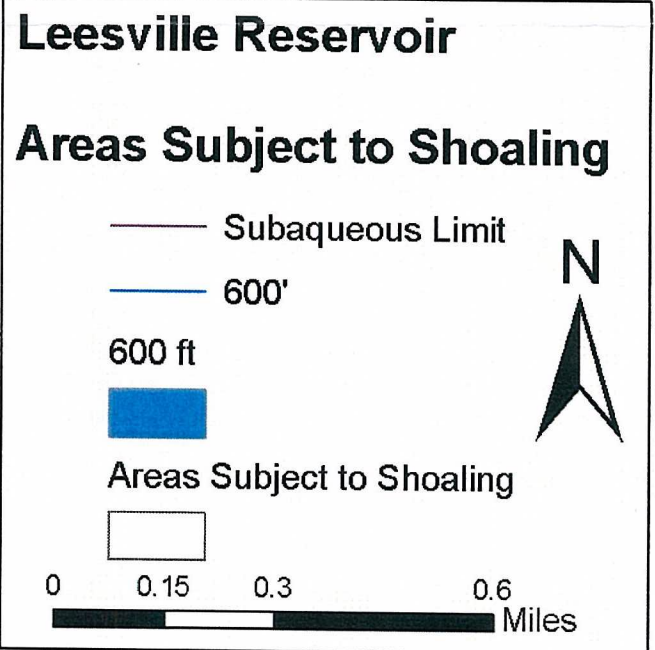
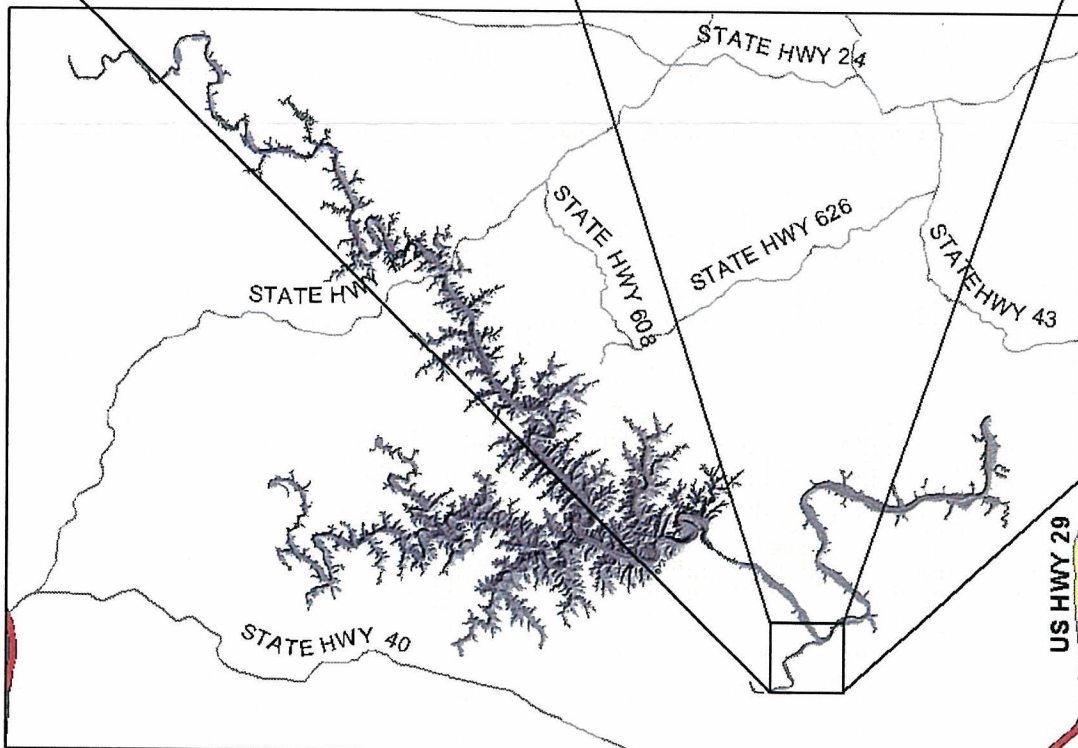


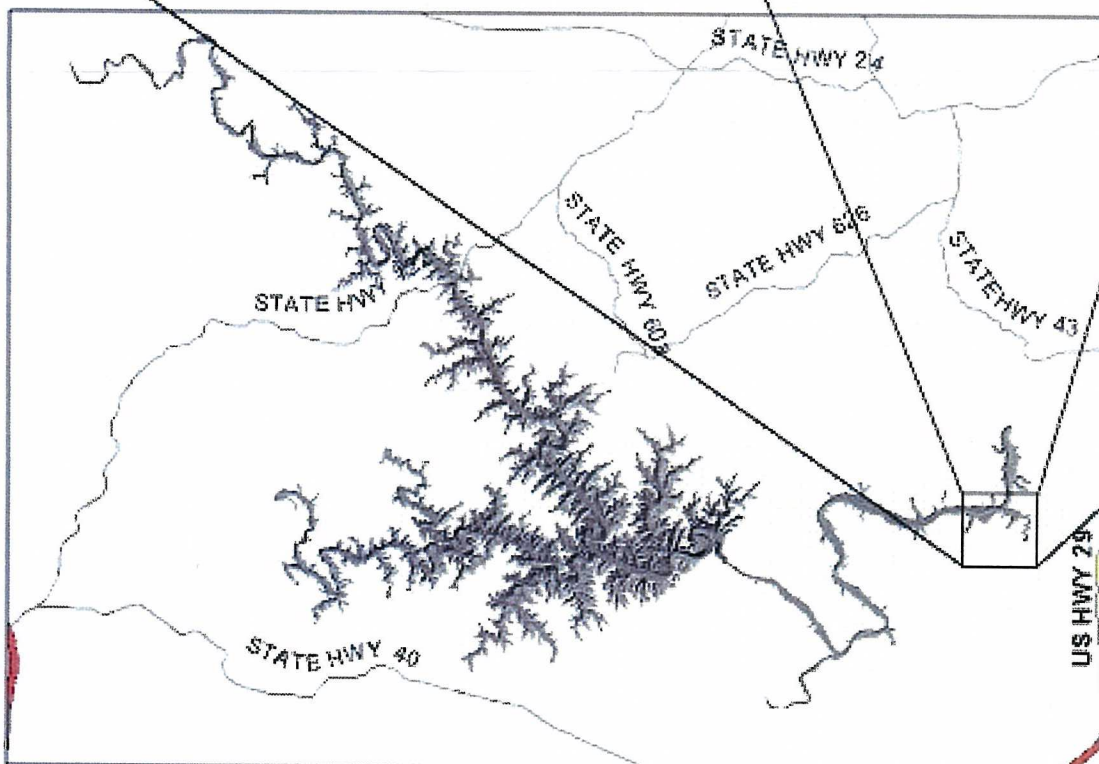
Areas Subject to Shoaling



0 0.125 0.25 0.5 Miles







Leesville Reservoir

Areas Subject to Shoaling

— Subaqueous Limit

— 600'

600 ft



Areas Subject to Shoaling

